THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 33

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte KUNIHIKO KAGA, SATORU KOTOH,
SHUJI OGAWA, and MASARU KANAOKA

Appeal No. 1997-1412
Application No. 08/139,888[1]

ON BRIEF

Before JERRY SMITH, FLEMING, and BARRY, Administrative Patent Judges.

BARRY, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on the appeal under 35 U.S.C. § 134 from the final rejection of claims 1, 6, 11, 12, and 23. We affirm.

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[1] The application was filed on October 22, 1993.

BACKGROUND

The invention at issue in this appeal relates to laser machining heads for cutting. When cutting metal with a laser beam, an assist gas such as oxygen is supplied to the cutting surface of the metal. The gas is used for an oxidized burning reaction. More specifically, the metal melted by the laser beam is sublimated or melted with an oxidized burning reaction. The gas is also used to blow off and eliminate melted and oxidized metal.

A conventional machining head features a main assist gas nozzle on the central axis of the head for supplying a main assist gas. Concentric sub assist gas outlets surround the flow of gas from the main gas nozzle and supply a sub assist gas. The direction of jet flow from the sub assist gas outlets is parallel to the direction of jet flow from the main assist gas outlet. This parallelism keeps the assist gas in a laminar flow. To reach the metal, however, the laminar flow

of assist gas must disperse through combustion products (viz., gas or melted metal) near the cutting surface.

The machining head of the invention features a main assist gas nozzle on its central axis. An annular, sub assist gas nozzle surrounds the main gas nozzle. The diameter of the outlet of the sub assist gas nozzle is at least as wide as that of the outlet of the main assist gas nozzle. Moreover, the outlet of the main assist gas nozzle is upstream from the outlet of the sub assist gas nozzle. This arrangement of nozzles ensures that the flows of the main assist gas and of the sub assist gas are not parallel and continuously changes the pressure and flow of the main assist gas at its outlet. The changes disturb the boundary layer in the combustion reaction area to replace the combustion products with fresh assist gas, which increases the speed of combustion.

Claim 1, which is representative for our purposes, follows:

> 1. A machining head of a laser machining apparatus through which a laser beam passes, comprising:

> a main assist gas nozzle at a center portion of the machining head for supplying a main assist gas; and
>
> at least one annular sub assist gas nozzle surrounding the main assist gas nozzle, a jet outlet at an innermost diameter of the annular sub assist gas nozzle being no smaller than a jet outlet of the main assist gas nozzle, for increasing pressure fluctuation and flow fluctuation of the main assist gas flow in comparison with the sub assist gas flow.

The references relied on in rejecting the claims follow:

Babel et al. 1992 (Babel)	5,149,937	Sep. 22,
Hisayoshi 1990. (Japanese Patent)	2-263585	Oct. 26,

Claims 1, 6, 11, and 12 stand rejected under 35 U.S.C. § 102(b) as anticipated by Babel. Claim 1 stands rejected under 35 U.S.C. § 102(b) as anticipated by Hisayoshi. Claims 6 and 23 stand rejected under 35 U.S.C. § 103 as obvious over Hisayoshi in view of Babel (Hisayoshi-Babel). Rather than repeat the arguments of the appellants or examiner in toto, we refer the reader to the briefs and answers for the respective details thereof.

OPINION

In reaching our decision in this appeal, we considered the subject matter on appeal and the rejections and evidence advanced by the examiner. Furthermore, we duly considered the arguments of the appellants and examiner. After considering the totality of the record, we are not persuaded that the examiner erred in rejecting claims 1, 6, 11, and 12 as anticipated by Babel or in rejecting claims 6 and 23 as obvious over Hisayoshi in view of Babel. We are persuaded, however, that the examiner erred in rejecting claim 1 as anticipated by Hisayoshi. Accordingly, we affirm. Our opinion addresses the grouping of claims 1, 6, 11, 12, and 23; the anticipation of claims 1, 6, 11, and 12 by Babel; the anticipation of claim 1 by Hisayoshi; and the obviousness of claims 6 and 23 over Hisayoshi-Babel.

Grouping of Claims 1, 6, 11, 12, and 23

37 C.F.R. § 1.192(c)(7), as amended at 60 Fed. Reg. 14518 (Mar. 17, 1995), was controlling when the appeal brief was filed. Section 1.192(c)(7) stated as follows.

> For each ground of rejection which appellant contests and which applies to a group of two or more claims, the Board shall select a single claim from the group and shall decide the appeal as to the ground of rejection on the basis of that claim alone unless a statement is included that the claims of the group do not stand or fall together and, in the argument under paragraph (c)(8) of this section, appellant explains why the claims of the group are believed to be separately patentable. Merely pointing out differences in what the claims cover is not an argument as to why the claims are separately patentable.

In addition, claims that are not argued separately stand or fall together. In re Kaslow, 707 F.2d 1366, 1376, 217 USPQ 1089, 1096 (Fed. Cir. 1983). When the patentability of dependent claims in particular is not argued separately, the claims stand or fall with the claims from which they depend. In re King, 801 F.2d 1324, 1325, 231 USPQ 136, 137 (Fed. Cir. 1986); In re Sernaker, 702 F.2d 989, 991, 217 USPQ 1, 3 (Fed. Cir. 1983).

The appellants state that the claims should be considered in the following groups for the appeal:

- claim 1
- claims 11 and 12

- claims 6 and 23.

(Appeal Br. at 3.) Conversely, the appellants omit a statement that claims 11 and 12 do not stand or fall together, a statement that claims 6 and 23 do not stand or fall together, and reasons why claims 12 and 23 are separately patentable. Therefore, we consider the claims to stand or fall together in the groups, with claims 1, 11, and 23, as the respective representative claims of the three groups. Next, we address the anticipation of claims 1, 6, 11, and 12 by Babel.

Anticipation of Claims 1, 6, 11, and 12 by Babel

Regarding claims 1, 6, 11, and 12, the appellants argue, "there is no evidence that Babel discloses an arrangement which inherently increases pressure fluctuation and flow fluctuation of the main assist gas flow in comparison with the sub assist gas flow." (Appeal Br. at 6.) The examiner replies, "The increase in pressure fluctuation recited in claim 1 is a result of a structure which produces a central main assist gas flow and an annular sub assist gas flow which

surrounds and intersects with the main assist gas flow." (Examiner's Answer at 8.) She adds, "Babel discloses a structure which produces the identical type of gas flows, and which will therefore produce the same results." (Id.) We agree with the examiner.

Independent claim 1 recites in pertinent part the following limitations:

> at least one annular sub assist gas nozzle surrounding the main assist gas nozzle, a jet outlet at an innermost diameter of the annular sub assist gas nozzle being no smaller than a jet outlet of the main assist gas nozzle, for increasing pressure fluctuation and flow fluctuation of the main assist gas flow in comparison with the sub assist gas flow.

Giving the claim its broadest reasonable interpretation, the limitations recite the function of increasing pressure fluctuation and flow fluctuation of a main assist gas flow in comparison with a sub assist gas flow.

In rejecting claims, the patent examiner bears the initial burden of presenting a prima facie case of unpatentability.

In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). When relying on inherency,[2] an examiner must provide a basis in fact or technical reasoning to reasonably support a determination that an allegedly inherent characteristic necessarily flows from the teachings of the applied prior art. Ex parte Levy, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Int. 1990).

Here, the examiner has met his initial burden. The appellants' specification reveals that they achieve the increase in pressure fluctuation and flow fluctuation of the main assist gas flow in comparison with the sub assist gas flow by a combination of three structural features. First, the diameter of the sub assist gas nozzle tapers from a wider, upstream diameter to a narrower, downstream diameter (D2). (Spec. at Fig. 1.) Second, the diameter of the outlet of the

[2]"Mere recitation of a newly discovered function or property, inherently possessed by things in the prior art, does not distinguish a claim drawn to those things from the prior art." In re Oelrich, 666 F.2d 578, 581, 212 USPQ 323, 326 (CCPA 1981) (citing In re Swinehart, 439 F.2d 210, 212-13, 169 USPQ 226, 229 (1971)).

sub assist gas nozzle (D2) is at least as wide as that of outlet of the main assist gas nozzle (D1). (Spec. at 9.) Third, the outlet of the main assist gas nozzle is upstream from that of the sub assist gas nozzle. (Id.)

Babel teaches the same combination of structural features. First, the diameter of a cone-shaped outer liner 30 tapers from a wider, upstream diameter on its flat upper side to a narrower, downstream diameter at its outlet. Fig. 8. Second, the diameter of the outlet of the cone-shaped outer liner 30 is at least as wide as that of outlet of the central multi-graduated passage hole 36. Id. Third, the outlet of cone-shaped outer liner 30 is upstream from that of the central multi-graduated passage hole 36. Id. We find that the combination of these features reasonably supports the examiner's determination that an increase in pressure fluctuation and flow fluctuation of the main assist gas flow in comparison with the sub assist gas flow necessarily flows from the teachings of Babel.

After the examiner meets the burden of establishing a prima facie case, the burden of coming forward with evidence or argument shifts to the appellants. Oetiker, 977 F.2d at 1445, 24 USPQ2d at 1444. After evidence or argument is submitted by the appellants in response, patentability is determined on the totality of the record, by a preponderance of evidence with due consideration to persuasiveness of argument. Id., 24 USPQ2d at 1444.

Here, the appellants submit neither evidence nor argument that an increase in pressure fluctuation and flow fluctuation of the main assist gas flow in comparison with the sub assist gas flow does not necessarily flow from the teachings of Babel. Instead, they merely allege, "there is no evidence that Babel discloses an arrangement which inherently increases pressure fluctuation and flow fluctuation of the main assist gas flow in comparison with the sub assist gas flow." (Appeal Br. at 6.) Because this allegation ignores the aforementioned combination of structural features found in both Babel and the appellants' invention, it is not persuasive.

Regarding claim 6, the appellants argue, “The embodiment of Babel Figure 9 ... shows the end of the insert 74 flush with the end of the conical nozzle tip 73. Thus, even the embodiment relied on does not show one nozzle placed upstream of another.” (Appeal Br. at 8.) The examiner replies, “Figure 8 of Babel shows the outlet of the main assist gas nozzle (31) located upstream from the outlet of the sub assist gas nozzle (30).” (Examiner’s Answer at 10.) We agree with the examiner.

The appellants err in considering the reference in less than its entirety. A reference must be considered as a whole for what it reveals “to workers in the art.” Panduit Corp. v. Dennison Mfg. Co., 810 F.2d 1561, 1566, 1 USPQ2d 1593, 1595 (Fed. Cir. 1987). Here, the appellants focus only on figure 9 of Babel. The reference teaches much more. As admitted by the appellants elsewhere, (Reply Br. at 1), Babel shows that the outlet of the cone-shaped outer liner 30 is upstream from that of the central multi-graduated passage hole 36. Fig. 8.

Regarding claims 11 and 12, the appellants make the following argument.

> Claims 11 and 12 are drafted using the "means plus function" format expressly permitted by 35 U.S.C. §112, paragraph 6. As such, the "static pressure conversion means" must be regarded as the structure disclosed in the specification and equivalents. The structure disclosed in the specification is pressure conversion surface 7 and return wall surface 8, which forms a residence space 8a. As can clearly be seen in Figure 14, the return wall surface 8 forms a residence space 8a which is not a through conduit. In other words, space 8a is a closed space having no fluid communication with another space except at the same place gas enters it. This is manifestly different in form and function from the ring channel 34, which is merely a distribution channel for gas inlet through the nipple 35. (Appeal Br. at 8.)

The examiner replies, “claim 11 should be construed as requiring only a pressure conversion surface, which Babel discloses. Claim 12 explicitly recites the conversion surface, and further requires a bank (wall) at in inside edge of the conversion surface, which is shown by Babel in the form of the inside wall of the channel.” (Examiner’s Answer at 10.) We agree with the examiner.

The appellants err by attempting to read limitations from the specification into the claims. “In the patentability

context, claims are to be given their broadest reasonable interpretations. Moreover, limitations are not to be read into the claims from the specification." In re Van Geuns, 988 F.2d 1181, 1184, 26 USPQ2d 1057, 1059 (Fed. Cir. 1993) (internal citations omitted).

Here, claim 11 specifies in pertinent part "a static pressure conversion means which converts dynamic pressure of an assist gas which flows into the sub assist gas nozzle through sub assist gas supply inlet into static pressure." The appellants' specification describes "a static pressure conversion means (a static pressure conversion surface 7, in this case) which converts the dynamic pressure of the sub assist gas flow supplied through the gas supply inlet 2c to static pressure are installed at the location where the gas flows pass [sic] through the gas duct 2b." (Spec. at 15-16.) It adds, "gas directed toward the inside of the assist gas nozzle 2b is recovered to the static pressure after colliding against static pressure conversion surface 7 ...." (Id. at 16.) Figure 13 of the appellants' specification depicts the static pressure conversion surface as element 7.

Giving claim 11, its broadest reasonable interpretation, the claim does not require a return wall surface 8 forming a residence space 8a that is not a through conduit as shown in Figure 14 of the appellants' specification and argued by the appellants. To the contrary, claim 11 merely requires a surface that opposes a gas inlet so as to collide with a flow of gas.

The examiner has identified a teaching of this limitation in Babel. Specifically, Figure 8 of the reference shows a nozzle. The nozzle includes the cone-shaped outer liner 30, which incorporates a core 31 and forms a narrow channel 32. Col. 7, ll. 46-49. The liner and core feature an upper side. Id. at ll. 51-52. A high-pressure gas flows from an inlet nipple 35 into a ring channel 34 and out the narrow channel. As evident from Figure 8, the gas will necessarily collide with the upper side of the liner and core during its flow from the inlet nipple to the narrow channel. Consequently, Babel teaches the static pressure conversion surface as specified in claim 11.

Claim 12 falls with claim 11. Nevertheless, we note that the claim specifies in pertinent part "a static pressure conversion surface which opposes the sub assist gas inlet; and a bank which is located at inside edge of the static pressure conversion surface and forms a space where the sub assist gas stays."

Giving claim 12, its broadest reasonable interpretation, the claim does not require a return wall surface 8 forming a residence space 8a that is not a through conduit as shown in Figure 14 of the appellants' specification and argued by the appellants. To the contrary, claim 12 merely requires the aforementioned static pressure conversion surface and a wall at the inside edge of the surface.

The examiner has identified a teaching of this limitation in Babel. As aforementioned, the reference teaches the static pressure conversion surface. Furthermore, Figure 8 of Babel shows that an intermediate piece 33 forms the walls of the ring channel and that these walls are at the inside edges of the upper side of the liner and of the core. Consequently,

Babel teaches the static pressure conversion surface and bank as specified in claim 12.

For the foregoing reasons, the examiner has established a prima facie case of anticipation, which the appelants have not refuted. Therefore, we affirm the examiner's rejection of claims 1, 6, 11, and 12 under 35 U.S.C. § 102(b) as anticipated by Babel. Next, we address the anticipation of claim 1 by Hisayoshi.

Anticipation of Claim 1 by Hisayoshi

The appellants note, "claim 1 recites that the sub assist gas nozzle increases pressure fluctuation and flow fluctuation of the main assist gas flow in comparison with the sub assist gas flow." (Appeal Br. at 7.) They argue, "there is no evidence that the Hisayoshi arrangement inherently achieves this effect. In this regard, note the arrows in Figures 1 and 2 of Hisayoshi which appear to show that the flow of fluid in the side channels exits the side channels almost vertically." (Id.) The examiner replies, "At least a portion of the gas exiting the annular orifice surrounding the central gas exit

(31) will flow along the sides of the inner nozzle (3), and intersect with the gas exiting from the central gas exit as a matter of basic fluid dynamics." (Examiner's Answer at 9.) We agree with the appellants.

The examiner fails to provide a basis in fact or technical reasoning to reasonably support a determination that the function of increasing pressure fluctuation and flow fluctuation of a main assist gas flow in comparison with a sub assist gas flow necessarily flows from the teachings of Hisayoshi. The reference does not teach all three of the structural features that the appellants use to achieve the claimed function. Specifically, the outlet of the gas nozzle formed by TIG welding electrodes 3 is not upstream of that formed by the walls of the torch 2.
Fig. 2.

For the foregoing reasons, the examiner has not established a prima facie case of anticipation. Therefore, we reverse the rejection of claims 1 under 35 U.S.C. § 102(b) as anticipated by Hisayoshi. Next and last, we address the obviousness of claims 6 and 23 over Hisayoshi-Babel.

Obviousness of Claims 6 and 23 over Hisayoshi-Babel

The appellants argue, "the embodiment of Figure 9 of Babel shows the end of the insert 74 flush with the end of the conical nozzle tip 73, not one nozzle placed upstream of another." (Appeal Br. at 9.) The examiner replies, "the two nozzles can be placed ... with the inner nozzle upstream from the outer nozzle as claimed and shown in Figure 8 ...." (Examiner's Answer at 11.) We agree with the examiner.

The appellants err in considering the reference in less than its entirety. Here, the appellants again focus only on figure 9 of Babel. The reference teaches much more. As admitted by the appellants elsewhere, (Reply Br. at 1), Babel shows that the outlet of the cone-shaped outer liner 30 is upstream from that of the central multi-graduated passage hole 36. Fig. 8.

The appellants also make the following argument.

> Babel et al. teaches that it is potentially beneficial to adjust the gauge and flow cross section of the conical channel. It is true that, in

> the arrangement of Babel et al., changing the gauge and flow cross section of the conical channel incidentally changes the relative position of the insert 74 and the conical nozzle tip 73. But this is not the point of the teaching of Babel et al., nor is it what can fairly be said to suggest to one of ordinary skill in art [sic]. Babel et al. attaches no significance to this incidental byproduct of changing the size of the conical channel. The only motivation in Babel et al. is to change the size of the conical channel, not to change the relative axial position of the elements at the tip. (Substitute Reply Br. at 2.)

The examiner replies, "Whether one forms this structure with the desire to control the absolute velocity of the gas or with the desire to control its fluctuation does not alter the conclusion that the use of this structure would have been obvious to one of ordinary skill in the art." (Supplemental Examiner's Answer at 2.) We agree with the examiner.

The appellants err in construing the criteria for obviousness. "Obviousness is not to be determined on the basis of purpose alone." In re Graf, 343 F.2d 774, 777, 145 USPQ 197, 199 (CCPA 1965). It is sufficient that references suggest doing what an appellant did, although the appellant's particular purpose was different from that of the references.

In re Heck, 699 F.2d 1331, 1333, 216 USPQ 1038, 1040 (Fed. Cir. 1983) (citing In re Gershon, 372 F.2d 535, 539, 152 USPQ 602, 605 (CCPA 1967)).

Here, Babel includes a proper suggestion for combining its teachings to obtain the claimed invention. The reference discloses that its conic flow channel 78 can be fine-tuned by screwing a threaded section 88 of insert 74 more- or less-deep. This permits the composition of a mixture and the kinetic energy of a pressure gas beam to be adjusted according to operating conditions. Col. 8, ll. 50-56. Because such an adjustment would be "potentially beneficial," (Substitute Reply Br. at 2), the teachings of the references would have suggested their combination. The suggestion does not have to be the same as the appellants' motivation for their invention.

For the foregoing reasons, the examiner has established a prima facie case of obviousness. Therefore, we affirm the examiner's rejection of claims 6 and 23 under 35 U.S.C. § 103 as obvious over Hisayoshi in view of Babel.

We end by noting that the aforementioned affirmances are based only on the arguments made in the briefs. Arguments not raised in the briefs are not before us, are not at issue, and are thus considered waived.

CONCLUSION

To summarize, the examiner's rejection of claims 1, 6, 11, and 12 under 35 U.S.C. § 102(b) as anticipated by Babel is affirmed. Her rejection of claim 1 under 35 U.S.C. § 102(b) as anticipated by Hisayoshi is reversed. The examiner's rejection of claims 6 and 23 under 35 U.S.C. § 103 as obvious over Hisayoshi in view of Babel is affirmed.

No period for taking subsequent action concerning this appeal may be extended under 37 C.F.R. § 1.136(a).

AFFIRMED

JERRY SMITH Administrative Patent Judge	)
MICHAEL R. FLEMING Administrative Patent Judge	) BOARD OF PATENT APPEALS AND INTERFERENCES
LANCE LEONARD BARRY Administrative Patent Judge	)

LLB/kis
BURNS, DOANE, SWECKER & MATHIS
The George Mason Building
Washington & Prince Streets
P. O. Box 1404
Alexandria, VA 22313-1404